HIC International Co Inc

PH: 011 - 5547 2400, 2874 5120

UNIVERSAL

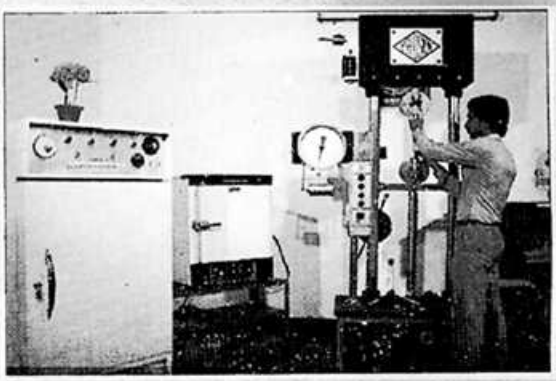
Looking toward tomorrow with fresh visions

Universal *HI-LIFE Polyester Cord V-Belts are the result of years of experience and practical exercise combining optimum strength and flexibility with marked resistance to wear.*

Right belts for the job are produced by studying the performance under actual operating conditions. **Universal** *H-LIFE has ben specially developed to cater to an ever increasing demand of quality conscious industries for higher and higher standards of working performance. Thus, this premium quality V-Belt that conforms to IS:2494 and International Specifications DIN 7753, has fostered many engineers and designers by providing answers to troublesome drive problems.*

Pulleys and couplings that are properly machined for easy installation.

Anil Gupta
President



In-house evaluation of Finished Belt on Tensile Testing Machine in the Lab.

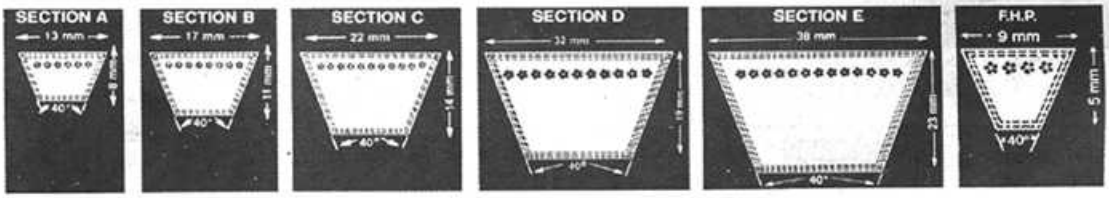
VEE - BELTS

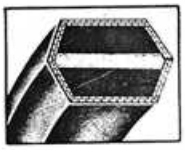
Vee Belts are used for motor to pulley power transmission in threshers, harvester combines, automobiles, rice mills, flour mills, textiles, sugar, fertilizer, cement, coal, thermal power plants, paper mills, ceramic industries, and other industrial applications and "Universal" offers polyester cord v-belts combining optimum strength and flexibility with marked resistance to wear.

Compound processing in mixing mill.

RANGE OF SECTION & SIZES (Conforming to IS : 2494, DIN 7753 and BS 3790)

CLASSICAL

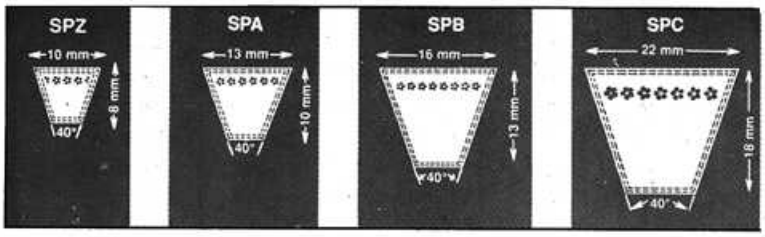




Range of Nominal Inside Length

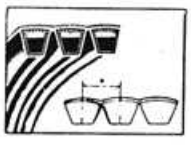
Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm
16-180	406-4572	24-360	610-9144	36-600	916-15240	75-600	1905-15240	158-600	4013-15240		2170-2664

SPACE SAVER WEDGE BELTS



Range of Nominal Inside Length

mm	mm	mm	mm
630-3550	800-4500	1250-12000	2000-12000



Banded Belts

For applications where pulsating or shock loads cause instability in conventional V-belts and / or space saver wedge belts.
The banded belt has enough lateral rigidity to eradicate problems caused by either belts turning over or whipping by joining together a number of belts with a tie band.

Poly Rib Belts

Poly Rib belts in sections, J,L & M with pitch length range upto 600" and no. of ribs upto 64 for usage in machine tools, grinders, vibrators, etc. which are truly precision built eliminating matching problem and reducing downtime & longer life signifying economy in terms of reduced replacement costs.

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NewDELHI-110 060, India
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Email: universal@hic-india.com

Material Handling & HillDrive Hydraulics Solutions

Universal
CONVEYOR TRANSMISSION

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LENGTH CODING SYSTEM When the code number 50 is shown on the cellotape affixed on each V-belt, this indicates that the actual length coincides with the nominal length printed on the belt. Each deviation of 2.5 mm from the nominal length is represented by one unit. For instance, a v-belt with size 100" coded 50 is exactly 100 inches inside length. If the code is 49, then it is 99.9" and if the code is 51, then it is 100.1" inside length.

MATCHED SETS The question of matched sets arises in case of multi V-belt drive as the length of V-belt should be matched in order to obtain even distribution of load. A 'Matched Set' is simply a set of such belts, the length of which are within the specified limits, so that these can be used together. The table as shown depicts the permissible length deviations in consecutive grading numbers marked near the size code which represents the exact length measured under specified operating tensions.

Section	Belt Pitch Length Exceeds Inside Length By (mm)	Pulley Outside Diameter Exceeds Pitch Diameter By (mm)
A	36	6.6
B	43	8.4
C	56	11.4
D	79	16.2
E	92	19.3
SPZ		4.0
SPA		6.0
SPB		7.0
SPC		9.6

Nominal Inside Length (mm)	Range (inches)	No. of consecutive grading number (s) to be used to make a matched set
457 to 1676	18-66	1
1702 to 2286	67-90	2
2311 to 3048	91-120	3
3073 to 4572	121-180	4
4597 to 9093	181-358	5
9119 and above	359 and above	6

DRIVE DESIGN FORMULAE

$$L = 2C + \frac{1.57(D+d)}{2} + \frac{(D-d)^2}{4C}$$

$$C = A + \sqrt{(A^2 - B)}$$

where

$$A = \frac{L}{4} - 0.3925(D+d)$$

$$B = \frac{(D-d)^2}{8}$$

$$\text{Number of belts, } N = \frac{P \times Fs}{R \times Fl \times Fc}$$

where

L = Belt Pitch Length, mm
C = Centre Distance, mm
D = Pitch dia. of large pulley, mm
d = Pitch dia. of small pulley, mm
R = Power Rating per belt, KW
Fl = Belt Length Correction Factor
Fc = Arc of contact correction Factor
Fs = Service Factor
P = Drive Power in KW.

Table 1 V-BELT CROSS SECTION SELECTION TABLE

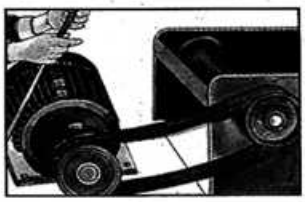
Normal Horse Power	Speed of Faster Shaft i.e. Motor Speed RPM			
	720 and below	900	1200	1800
½ to ½	A	A	A	A
2 to 3	A or B	A or B	A or B	A or B
5	A or B	A or B	A or B	A or B
10	A or B	A or B	A or B	A or B
15	C	B or C	B or C	B
20	C	C	C	B or C
25 to 30	C	C	C	C
40	D	C or D	C or D	C
50	D	C or D	C or D	C or D
60	D	C or D	C or D	C or D
75	D	C or D	C or D	C or D

Table 2 RECOMMENDED PULLEY PITCH DIAMETERS

V-Belt Section	Permissible Min. Pulley Pitch Diameter mm	inch	Recommended Min. Pulley Pitch Daimeter mm	inch
A	75	3	95	3.8
B	125	5	145	5.8
C	200	8	225	9
D	315	12.6	350	14
E	500	20	550	22
SPZ	-	-	63	2.5
SPA	-	-	90	3.6
SPB	-	-	160	6.4
SPC	-	-	224	9.0

1 KW = H.P. x 0.746

Please note that with smaller pulley diameter than those recommended, the life of belt is reduced considereably and also the transmitting power decreases. It is necessary to ensure that at least belt run on pulleys that are not below the permissible minimum diameter for each section.



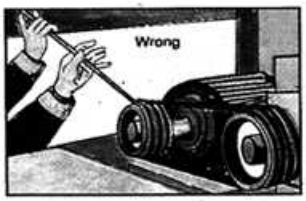
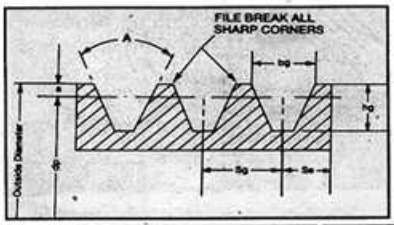


Table 3 STANDARD PULLEY DIMENSIONS

Grove Cross-section	Pulley Pitch Diameter dp (mm)	Grove Angle A degree ± 0.5°	Minimum Top width of groove g (mm)	Minimum Groove depth below outside diameter hg (mm)	Centre to Centre of grooves Sg (mm)	Edge of Pulley of First Groove Centre (mm)
SPZ	Upto 80	34	9.7	11.0	12± 0.3	8.0 ± 1.0
	Over 80	38	9.9			
A	Upto 118	34	13.0			10.0±2.0
SPA	Over 118	34	13.3	13.8	15 ± 0.3	- 1.0
B	Upto 190	34	16.6			12.5 ± 2.0
SPB	Over 190	38	16.9	17.5	19 ± 0.4	- 1.0
C	Upto 315	38	22.9	23.8	25.5 ± 0.5	- 1.0
SPC	Over 315	38	22.9	23.8	25.5 ± 0.5	- 1.0
D	Upto 475	36	32.2			24.0 + 3.0
	Over 475	38	32.6	28.0	37.0 ± 0.6	- 1.0
E	Upto 630	36	38.3			29 + 4.0
	Over 630	38	38.6	33.0	44.5 ± 0.7	- 1.0

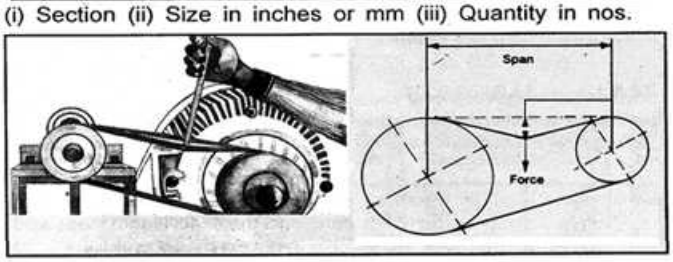
When the pulley are to be used for V-belt sections, A, B or C only, dimension hg may be reduced by 20%

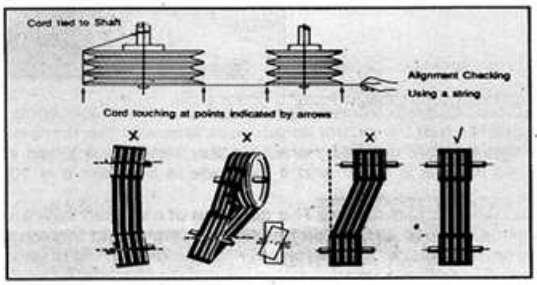


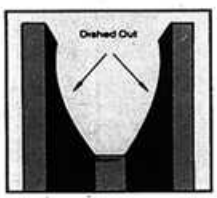
Universal urges to use standard premium quality Vee Belt Pulleys either conventional type or new generation quick-fit taper lock bush type manufacutred by the co. to drag better mileage from V-belt dirves.

INFORMATION TO BE SUPPLIED WITH ENQUIRY OR ORDER

(i) Section (ii) Size in inches or mm (iii) Quantity in nos.







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CONVEYOR TRANSMISSION

Table 4 SERVICE FACTORS FOR TYPE OF DRIVEN MACHINES

To correct the horse power rating of the V-belt drive for the type of service on which is to be used, multiply the motor horse power transmitted by the power correction factor as given in the table, taking into account type of driven machine and the operational hours per day.

SPEED INCREASING DRIVES For Speed Increasing drives, Multiply Fs with 1.00 for speed Ratio 1.00 to 1.24 1.05 for speed Ratio 1.25 to 1.74 1.11 for speed Ratio 1.75 to 2.49 1.18 for speed Ratio 2.50 to 3.49 1.25 for speed Ratio 3.50 and Over		*TYPES OF PRIME MOVERS* **Soft Starts** Electric Motors (Normal Torque) : A.C. - Star-Delta Start D.C. - Shut wound I.C. Engines with 4 or more cylinder all prime movers fitted with centrifugal clutches, fluid or powder couplings			**Heavy Starts** Electric Motors (High Torque) : A.C. Direct on-line start D.C. - Series and compound wound I.C. Engines with less than 4 cylinders Line shafts, clutches.		
Types of Driven Machines		**Operational Hours per day**			**Operational Hours per day**		
		Upto 10 h	Over 10 to 16 h	Over 16 h	Upto 10 h	Over 10 to 16 h	Over 16 h
Light Duty	Agitators (Uniform density). Blowersm Exhausters, Centrifugal pumps and Compressors, Fans upto 7.5 kw and Belt conveyors (light duty).	1.0	1.1	1.2	1.1	1.2	1.3
Medium Duty	Agitators and Mixers (Vairable density), Blowers, Exhausters and fans and Dough mixers over 7.5 kw, positive displacement rotary pumps and compressors. Belt conveyers (Not uniformly loaded), Generators, line-shafts, Laundry machinery, Machine-tools, punches, presses and shears, Printing machinery, Revolving and Vibrating screens.	1.1	1.2	1.3	1.2	1.3	1.4
Heavy Duty	Brick machinery, Bucket elevators, Exciters, Reciprocating compressors and pumps, Conveyors (drag-pan-screw), Hammer mills, Paper mill beaters, Pulverizers, Saw mill and Wood working machinery, Textile machinery and Rubber machinery.	1.2	1.3	1.4	1.4	1.5	1.6
Extra Heavy Duty	Crushers (gyratory-jaw-roll), Mills (Bal-rod-tube), hoists, Rubber (calenders, extuders mills).	1.3	1.4	1.5	1.5	1.6	1.8

Table 5 ARC OF CONTACT CORRECTION FACTORS

$\frac{D-d}{C}$	Factor Fc	Arc of contact on smaller pulley, degrees	$\frac{D-d}{C}$	Factor Fc	Arc of contact on smaller pulley, degrees	$\frac{D-d}{C}$	Factor Fc	Arc of contact on smaller pulley, degrees
0.00	1.00	180	0.50	0.93	151	1.00	0.82	120
0.05	0.99	177	0.55	0.92	148	1.05	0.81	117
0.10	0.99	174	0.60	0.91	145	1.10	0.80	113
0.15	0.98	171	0.65	0.90	142	1.15	0.78	110
0.20	0.97	169	0.70	0.89	139	1.20	0.77	106
0.25	0.97	166	0.75	0.88	136	1.25	0.75	103
0.30	0.96	163	0.80	0.87	133	1.30	0.73	99
0.35	0.95	160	0.85	0.86	130	1.35	0.72	95
0.40	0.94	157	0.90	0.85	127	1.40	0.70	91
0.45	0.93	154	0.95	0.83	123	1.45	0.68	87

Arc of contact below 120° should not please be used unless complete drive details are submitted to HIC International Co. Inc., New Delhi for confirmation.

Table 6 CORRECTION FACTORS FOR BELT LENGTH

	Belt Length, mm								
Factor	SPZ	A	SPA	B	SPB	C	SPC	D	E
0.80	-	610	-	-	-	1295	-	-	-
0.81	-	660	-	889	-	-	-	-	-
0.82	-	711	800	-	-	1524	-	-	-
0.83	630	-	-	965	-	-	-	-	-
0.84	-	787	900	1016	-	-	-	-	-
0.85	710	813	-	1067	1250	1727	2000	3048	-
0.86	-	-	1000	-	-	-	-	3251	-
0.87	800	889	-	1168	1400	1905	2240	-	-
0.88	-	965	1120	-	1500	2057	-	3658	-
0.89	900	1016	-	1295	1600	2159	2500	-	-
0.90	-	1067	1250	-	-	2286	2800	4013	-
0.91	-	-	-	1473	1800	2458	-	-	-
0.92	1000	1168	1400	-	-	-	3150	4572	5334
0.93	-	-	-	1651	2000	2667	-	-	-
0.94	1140	1295	1600	1778	-	2845	3550	5334	6045
0.95	-	-	-	-	2240	-	-	-	-
0.96	1250	1397	1800	1905	2500	3048	4000	6045	6807
0.97	-	-	-	-	-	3251	4500	-	-
0.98	1400	1524	2000	2159	2800	-	-	6807	7569
0.99	-	-	-	2286	-	3658	5000	-	-
1.00	1600	1651	2240	-	3150	4013	-	8331	9093
1.01	-	1778	-	2464	-	-	5600	-	-
1.02	1800	1905	2500	2540	3550	4572	6300	9093	9855
1.03	-	-	-	2667	-	-	-	-	-
1.04	2000	2032	2800	2845	4000	5334	7100	9855	10617
1.05	-	-	-	-	-	-	-	-	-
1.06	2240	2286	3150	3048	4500	-	8000	10617	12141
1.07	-	-	-	3251	-	6807	-	-	-
1.08	2500	2438	3550	-	5000	-	9000	12141	13665
1.09	-	-	-	3658	-	-	10000	-	-
1.10	2800	2667	4000	-	5600	-	-	13665	15189
1.11	-	2845	-	4013	6300	-	11200	-	-
1.12	3150	-	4500	4115	-	9093	-	15189	-
1.13	-	3048	-	-	7100	-	12500	-	-
1.14	-	3251	-	4572	-	9855	-	-	-
1.15	3550	-	-	-	8000	10617	-	-	-
1.16	-	-	-	5334	-	-	-	-	-
1.17	-	-	-	-	-	-	-	-	-
1.18	-	-	-	-	-	-	-	-	-
1.19	-	-	-	-	-	-	-	-	-
1.20	-	-	-	-	-	-	-	-	-
1.21	-	-	-	-	-	-	-	-	-
1.22	-	-	-	-	-	-	-	-	-
1.23	-	-	-	-	-	-	-	-	-
1.24	-	-	-	-	-	-	-	-	-

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Table 7 (R) POWER RATING (KW) PER BELT FOR SMALL PULLEY PITCH DIAMETER

	RPM of smaller pulley	Smaller pulley pitch diameter, mm															1.02 to 1.05	1.06 to 1.11	1.12 to 1.18	1.19 to 1.26	1.27 to 1.38	1.39 to 1.57	1.58 to 1.94	1.95 to 3.38	3.39 and Over
		60	67	71	75	80	85	90	95	100	106	112	118	125	132	140									
SPZ	720	0.56	0.65	0.76	0.84	0.97	1.08	1.19	1.30	1.46	1.57	1.73	1.87	2.03	2.18	2.38	0.01	0.03	0.05	0.06	0.08	0.09	0.10	0.11	0.12
	960	0.70	0.83	0.95	1.08	1.24	1.40	1.57	1.73	1.89	2.05	2.27	2.43	2.65	2.86	3.08	0.01	0.04	0.06	0.08	0.10	0.12	0.13	0.15	0.15
	1440	0.97	1.13	1.35	1.51	1.73	1.94	2.16	2.43	2.61	2.88	3.14	3.40	3.73	4.00	4.34	0.02	0.05	0.09	0.13	0.15	0.18	0.20	0.22	0.23
	2880	1.57	1.89	2.21	2.54	2.97	3.40	3.78	4.21	4.59	5.02	5.51	5.94	6.48	6.99	7.56	0.04	0.11	0.18	0.25	0.30	0.36	0.40	0.44	0.45
		80	85	90	95	100	106	112	118	125	132	140	150	160	180	200									
		0.67	0.75	0.83	0.91	0.99	1.09	1.18	1.28	1.39	1.50	1.62	-	-	-	-	0.01	0.02	0.03	0.05	0.06	0.07	0.08	0.09	0.09
	720	-	-	1.24	1.46	1.67	1.92	2.17	2.42	2.70	3.00	3.32	3.73	4.13	4.93	5.12	0.02	0.07	0.12	0.16	0.20	0.23	0.26	0.28	0.30
		0.84	0.95	1.05	1.16	1.25	1.39	1.50	1.62	1.77	1.91	2.06	-	-	-	-	0.01	0.03	0.04	0.06	0.08	0.09	0.10	0.12	0.12
A	960	-	-	1.54	1.82	2.09	2.42	2.74	3.06	3.43	3.82	4.25	4.74	5.29	6.32	7.36	0.03	0.09	0.16	0.21	0.26	0.30	0.34	0.37	0.40
		1.14	1.28	1.43	1.59	1.73	1.91	2.08	2.26	2.46	2.66	2.88	-	-	-	-	0.02	0.04	0.06	0.10	0.12	0.14	0.16	0.17	0.17
SPA	1440	-	-	2.05	2.45	2.84	3.31	3.77	4.24	4.77	5.31	5.91	6.65	7.39	8.83	10.25	0.05	0.14	0.24	0.32	0.39	0.46	0.51	0.56	0.59
		1.83	2.10	2.35	2.60	2.84	3.10	3.39	3.61	3.95	4.25	4.58	-	-	-	-	0.04	0.08	0.12	0.18	0.23	0.27	0.31	0.35	0.35
	2880	-	-	3.11	3.79	4.49	5.32	6.15	6.94	7.87	8.77	9.78	11.01	12.20	14.43	-	0.10	0.27	0.47	0.64	0.78	0.91	1.03	1.12	1.19
		125	132	140	150	160	170	180	190	200	212	224	236	250	280	315									
		1.78	1.96	2.18	2.45	2.72	3.00	3.26	3.52	3.79	-	-	-	-	-	-	0.03	0.05	0.08	0.12	0.15	0.18	0.20	0.23	0.23
	720	-	-	-	-	5.01	5.62	6.25	6.88	7.49	8.24	8.97	9.70	10.54	12.33	14.37	0.05	0.14	0.25	0.33	0.41	0.48	0.54	0.59	0.62
		2.22	2.46	2.75	3.10	3.44	3.78	4.12	4.45	4.75	-	-	-	-	-	-	0.03	0.07	0.10	0.16	0.20	0.24	0.27	0.30	0.30
B	960	-	-	-	-	6.30	7.12	7.93	8.73	9.53	10.47	11.42	12.35	13.42	15.69	18.26	0.07	0.19	0.32	0.44	0.54	0.62	0.70	0.77	0.81
		3.03	3.33	3.72	4.20	4.68	5.14	5.59	6.05	6.49	-	-	-	-	-	-	0.05	0.10	0.15	0.23	0.30	0.36	0.41	0.46	0.46
SPB	1440	-	-	-	-	7.85	8.89	9.93	10.95	11.95	13.15	14.32	15.48	16.80	19.55	22.57	0.10	0.28	0.48	0.66	0.79	0.94	1.06	1.15	1.21
		4.35	4.88	5.44	6.10	6.72	7.28	7.78	8.22	-	-	-	-	-	-	-	0.10	0.20	0.30	0.46	0.61	0.71	0.81	0.91	0.91
	2880	-	-	-	-	13.24	15.05	16.78	18.44	-	-	-	-	-	-	-	0.20	0.56	0.97	1.32	1.60	1.88	2.11	2.31	2.44
		200	212	224	236	250	265	300	315	355	375	400	425	450	500	560									
		5.15	5.69	6.27	6.84	7.49	8.86	9.76	10.43	12.15	13.00	14.02	-	-	-	-	0.07	0.14	0.21	0.32	0.42	0.49	0.56	0.63	0.63
C	720	-	-	13.34	12.81	14.50	18.07	20.42	22.17	26.75	29.00	31.78	34.51	37.20	42.44	48.47	0.16	0.43	0.76	1.03	1.25	1.46	1.65	1.80	1.90
		6.35	7.05	7.78	8.49	9.30	11.00	12.08	12.89	14.93	15.90	17.06	-	-	-	-	0.09	0.19	0.28	0.45	0.56	0.66	0.75	0.85	0.85
SPC	960	-	-	14.07	15.94	18.09	22.62	25.59	27.77	33.48	36.25	39.64	42.95	46.15	52.30	59.15	0.21	0.58	1.01	1.37	1.67	1.95	2.20	2.40	2.54
		8.25	9.20	10.12	11.03	12.04	14.09	15.35	16.23	18.32	19.22	-	-	-	-	-	0.14	0.28	0.42	0.68	0.85	0.99	1.13	1.27	1.27
	1440	-	-	18.41	20.96	23.87	29.90	33.78	36.59	43.70	47.04	-	-	-	-	-	0.31	0.87	1.51	2.06	2.50	2.93	3.30	3.50	3.81
		315	330	340	350	355	390	465	540	620															
D	585	12.56	13.83	14.67	15.49	16.70	18.71	24.40	29.61	34.60							0.21	0.42	0.62	1.04	1.25	1.46	1.67	1.88	1.88
	720	14.90	16.15	17.00	17.84	18.80	21.02	27.35	33.12	38.61							0.25	0.50	0.75	1.25	1.50	1.75	2.00	2.25	2.25
	960	16.77	18.45	19.55	20.64	22.24	24.80	31.68	37.54	-							0.33	0.67	1.00	1.60	2.00	2.33	2.67	3.00	3.00
	1440	18.73	20.55	21.71	22.81	24.36	26.68	-	-	-							0.50	1.00	1.50	2.50	3.00	3.50	4.00	4.50	4.50
		500	530	560	570	580	600	610	635	660															
E	585	25.73	28.75	31.70	34.52	37.39	39.90	42.83	44.85	46.92							0.41	0.83	1.24	2.07	2.48	2.89	3.00	3.72	3.72
	720	28.68	32.01	35.18	38.31	41.30	44.13	46.85	49.44	51.86							0.50	0.99	1.49	2.48	2.98	3.51	3.98	4.48	4.48
	960	30.61	34.05	37.14	40.15	42.79	45.17	-	-	-							0.66	1.33	1.98	3.31	3.97	4.63	5.29	5.95	5.95

Belt Speed (feet per minute) = [Pitch Diameter of Drive Sheave in Inches] x R.P.M. of Prime Mover x 0.262